SOME INTESTINAL PARASITES IN THE DUCK FROM JAPAN

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TWO FIGURES

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Studies on Trematodes in the duck from Formosa were reported by M. Sugimoto (1915, 1919, 1925), K. Tsuchimochi (1924) and K. Morishita (1929). We obtained a large number of duck intestines from a poultry raiser and searched for parasitic worms in different times of the year. It has been found that about fifty per cent. of our specimens harboured parasites. We shall here report of eleven species of the parasites, one of them being regarded as new to science. We wish to express our sincere thanks to Dr. Sadao Yoshida for his kind guidance.

I. TREMATODES

1. *Echinostoma revoltum* (Frölich, 1802).
   Synonym: *Echinostoma echinatum* (Zedder, 1803).

This species was found in the rectum and cæca of the duck, goose, swan and fowl, besides in a number of wild aquatic birds. This is the commonest parasite found in Osaka, probably widely distributed in all Japan. The "head-crown" usually has 37 spines but the younger ones have only 35. The testes are extremely variable in shape, but are usually dendrite or round.

The cercariæ of this species were found by Tsuchimochi (1924) in some fresh-water snails, e.g. *Lymnaea swinhoe, L. pervia* and *Planorbis* sp.

2. *Echinostoma paraulum* Dietz, 1909.

We found only a few of this species. It differs from *E. revoltum* only in minor characteristics. The head-crown has 37 spines, like that of *E. revoltum*. Its body is a little shorter than that of *E. revoltum* and differs in that the testes are divided by a constriction into two unequal parts. We are doubtful whether it is really a distinct species from *E. revoltum*.

3. *Hypoderaem conoideum* (Bloch, 1782).

We found this trematode in the cæca and large intestine mixed with many individuals of *E. revoltum*. This species was rarely found in our research, but was formerly reported in fowls and ducks from Japan proper and Formosa. The life-history of this species was studied by Morishita and Tsuchimochi (1925) in Formosa.

4. *Notocotylus urbanensis* Cort, 1914.

A. Hassall collected this worm from the intestine and cæca of *Dafila acuta*, *Fiber zibethicus* and *Aix sponsa* (1892 and 1893) in Maryland. C. W. Stiles and A. Hassal reported "*Monostoma* sp." in 1894. W. W. Cort found *Cercaria urbanensis* in the fresh-water snail *Physa gyrina* Say, taken from drainage ditches near Urbana, Illinois, U.S.A., and in 1918 E. C. Faust described seven larval Monostomata found in North America. In 1922 E. C. Harrah reported the morphology of different stages of *Notocotylus urbanensis* based upon the specimens of the United States National Museum and stated that though demonstration of the life-history by experimental study had not been given, it seemed justifiable to accept *Cercaria urbanensis* as the larval form of this species.

We found a number of these worms in the intestine and cæca of many ducks. The specificity of distinct species is shown by three rows of ventral wart-like projections, each row containing 13 to 14 glands in the mature stage, but in the young specimens the glands are smaller in number than in the mature.

T. Odhner (1905) described *Notocotylus aegyptiacus* from the cæca of the duck found in Egypt, having 12 to 14 groups of glands in each row. Harrah said that *N. urbanensis* differs from *N. aegyptiacus* in the relative length of the cirrus pouch and vagina. But we are somewhat doubtful whether it deserves to be regarded as a distinct species.

5. *Strigea gracilis* (Rudolphi, 1819).

We collected many specimens from the intestine of duck taken from the harbour work market in Osaka, but this was the rarest case

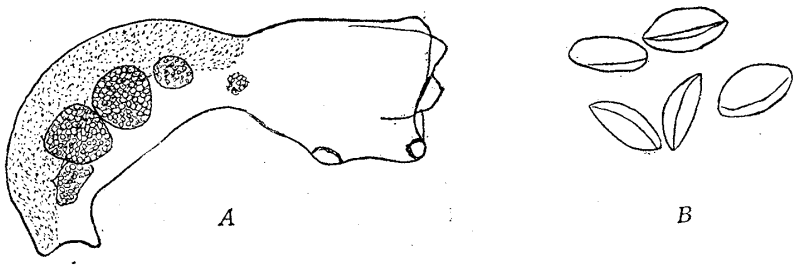

Fig. 1. *Strigea gracilis*. *A*. Side view. × 35. *B*. Eggs. × 80

in our research. The body is distinctly divided by a constriction into two portions, of which the anterior is much wider than the posterior. The eggs are relatively few and large. The measurements of our specimens are as follows:

Length of body...	1.21—2.25 mm.
Length of the anterior portion	0.36—0.8 mm.
Length of the posterior portion	0.85—1.45 mm.
Testis	0.17—0.19 mm.
Ovary	0.09—0.12 mm.
Egg.	0.093—0.12 × 0.065 mm.

II. CESTODES

6. *Fimbriaria fasciolaris* (Pallas, 1781).

This is a parasite of the duck, goose, fowl and many species of wild birds, chiefly belonging to the duck tribe. Members of this genus have a remarkable pseudoscolex which consists of many segments of triangular shape. We found this species in the intestine of the domestic duck, but it was rather rare in our study.

7. *Weinlandia macrostrobiloides* Mayhew, 1925.

R. L. Mayhew (1925) described this species found in the intestine of *Anas rubripes*, the black duck, from Illinois. We found many specimens in the intestine of domestic ducks, and it was the commonest cestode found in our research.

8. *Hymenolepis* sp.

We collected some proglottids of *Hymenolepis*, but all were incomplete. Meggitt (1925, 1927) and Mayhew (1925) reported a large number of species of avian *Hymenolepis*. We could not identify our specimens.

9. *Raillietina osakensis*, sp. nov. (Fig. 2).

We obtained many proglottids of *Raillietiana* from the intestine of domestic duck, but could not collect perfect specimens. F. J. Meggitt reported many species of this genus from the domestic fowl. Our specimens differ from those species of Meggitt's collections. This new species is characterized by the extreme specialization of its anatomy, especially the number of testes and eggs in each capsule.

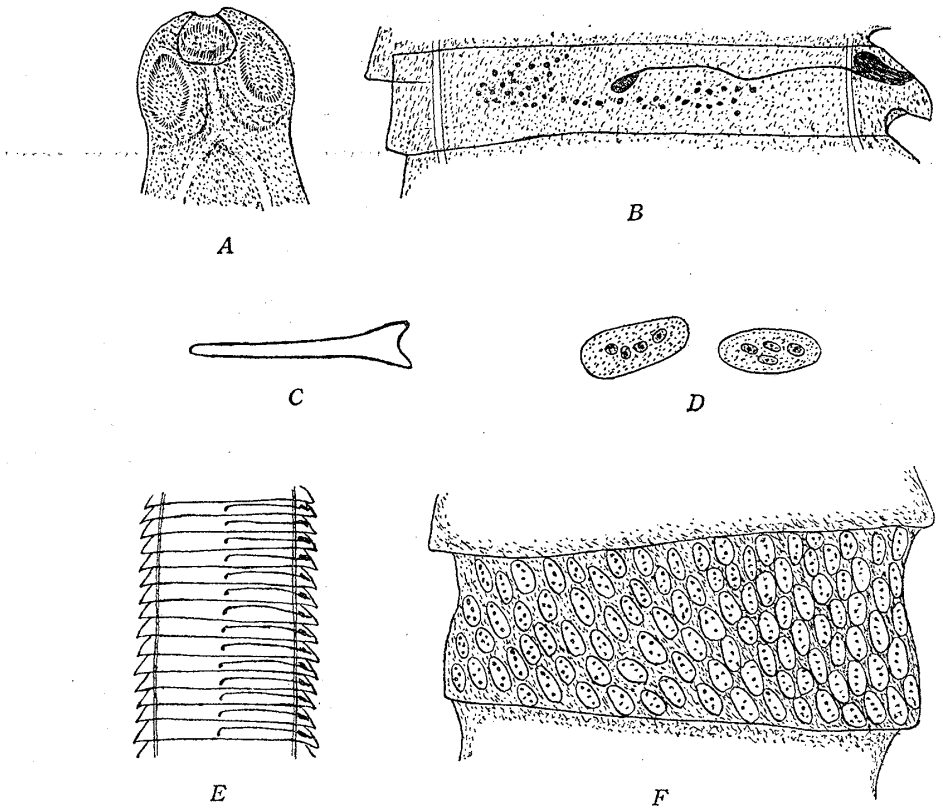

Fig. 2.—*Raillietina osakensis*, sp. nov. *A*. Scolex. × 80. *B*. Mature proglottid. × 50. *C*. Rostellar hook. *D*. Capsules with eggs. × 80. *E*. Proglottids. × 16. *F*. Gravid proglottid. × 16.

Diagnosis: The whole length of this worm is unknown, because all our worms are represented by incomplete specimens; the breadth is 4—5 mm. All the mature proglottids are very much broader than long, and the longest one is 1.2 mm in length. The shape of the worm is characteristic, the anterior portion being very slender and threadlike, and gradually broadening posteriorly. The scolex is very small and is provided with about 150—200 rostellar hooks, measuring 15—18 μ. The acetabular hooks are present. The genital pores are situated in the

unilateral side of the body. The cirrus sac does not rearch the excretory canal. The number of testes is 40—50 in each proglottid, and irregularly arranged (fig. 2, *B*). The gravid proglottids (fig. 2, *F*) are full of egg-capsules, but the testes are not recognizable. The capsule measuring 150—180 μ in diameter contains four eggs, and the egg is 25—35 μ in diameter.

Distribution: Japan proper.

III. NEMATODES.

10. *Ascaridis perspicillum* (Rudolphi, 1803)

This worm is a common parasite of the fowl, turkey, guinea fowl, and duck in Europe and Asia, and has also been recorded as being found in fowl and turkey in Japan. One of us (Iwata) obtained this species from the intestine of a white pigeon in the Osaka Zoological Garden. We found this worm of various sizes, in the intestine of the duck also.

11. *Heterakis gallinae* (Gmelin, 1790).

Synonym: *H. papillosa* (Bloch, 1782), *H. vesicularis* (Frölich, 1791).

This species is the commonest parasite in the intestine, especially in the cæca of fowl, turkey, pigeon, goose and duck. We found a large number of individuals of this species in the course of our study.

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